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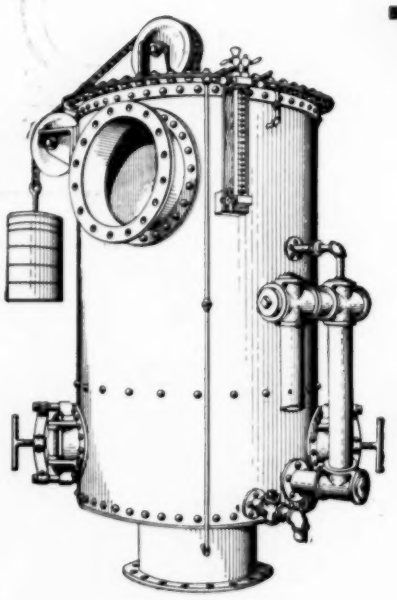

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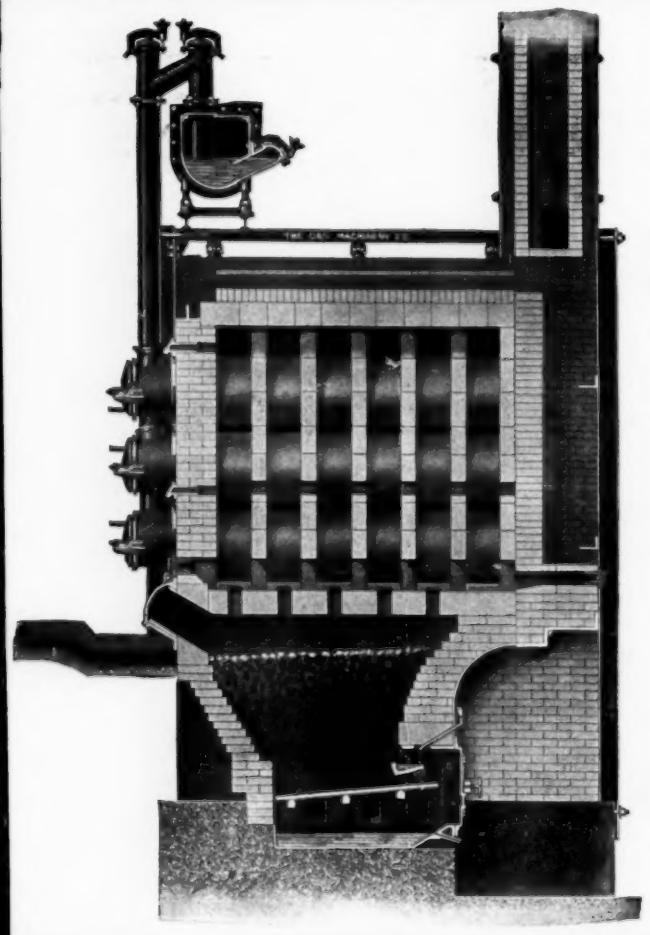

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THE AMERICAN
GAS LIGHT JOURNAL
INC.

VOL. LIII., No. 13. NEW YORK, SEPTEMBER 27, 1915. WHOLE No. 2,123.

GAS LIGHTING DEVELOPMENT.

Burners, Fixtures and Accessories.

THURSTON OWENS.

The new burners, fixtures, lamps and accessories that have been put on the market during the past 2 or 3 years, are of such novel design and construction, and have so many points of superiority that one could write a volume and then but partly cover the field. At no period have there been developments of such intrinsic merit and of such variety and scope in Gas Lighting Equipments, and at no time has there been a greater need of this equipment.

THE USER OF LIGHT DEMANDS STYLE AS WELL AS EFFICIENCY.

The fact that the developments have permitted fashion to be followed has much to do with their successful introduction.

The Replacement Burner.—The most important outlet to provide for at present is existing business. That means the sale of replacement burners, and the opportunities for development in such burner design appear to be greatest along the lines of the Junior (Fig. 3) and C. E. Z. (Fig. 4). The former is compact and of the correct size for Electric Glassware: and the latter may be used with old upright open flame glassware, or new globes provided. The C. E. Z. is the only low pressure burner that does not entrain air at top of mantle, the mantles being screwed on the nozzles.

The inverted type replacement burner offers good opportunities for further development as it is usually stronger and more efficient than the upright type, due to the shape and size of the mantle.

The opportunities for the sale of these burners are enormous; the places ready to receive them number in the millions.

Fig. 2.—No Discoloration.

Mantles.—Improvements in manufacturing methods, in materials for the structure, and an enormous increase in production have placed better mantles at lower prices in the hands of the consumer. The home consumption has increased from 40 millions in 1904, to 80 millions in 1914. The combination of rare earths perfected by Dr. Auer 25 years ago has not been improved upon, and the shapes made, follow conventional lines. The future holds bright prospects for the chemist who can produce oxides equal to Thorium and Cerium, and having greater structural strength.

Many Types of Burners.—The development of fixtures for gas lighting has no analogy in the electric field, as the electric burner in 90% of the cases is the incandescent lamp; whereas, in the gas field different burners are almost as numerous as the applications.

From an economic standpoint, this is important and could be examined further with advantage. A glaring instance of this condition can be illustrated by the equipment of an ordinary home with an installation like the following:

Cellar	Open flame tip.
Laundry	Inverted burner, No. 8 mantle.
Kitchen	Upright burner, standard mantle.
Halls	" " Junior mantle,
Entrance hall	" " C. E. Z. mantle.
Drawing room	Inverted burner, No. 3 mantle.
Living rooms	Horizontal burners, No. 3 mantle,
Bed rooms	Upright burner, Junior mantle.

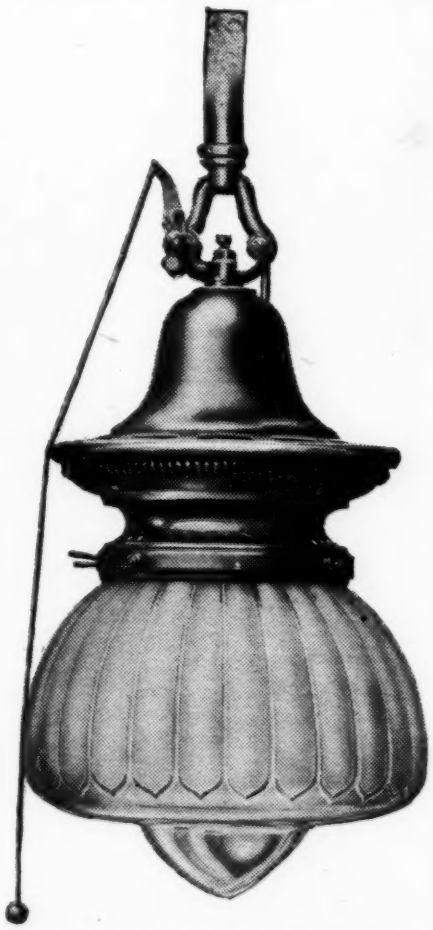

Fig. 1.—An Arc Lamp without a "Stack."

This consumer would need 5 styles of mantles for replacement, none of which are interchangeable. To obtain the same result with electricity, five sizes of lamps also would be best, but they would be interchangeable.

The replacement burner will help hold the

85 MILLION DOLLARS

Received annually by American Gas Companies for lighting

Fig. 3.—The Junior takes the place of the open tip.

Influence of Burners on Fixture Design.—Fixture development has gone from the open flame tip to the upright mantle burner, the inverted mantle burner, the junior upright, with electric glass ware, the C. E. Z. inverted and the one mantle horizontal, in the order named.

As with the replacement burner, the best burner for new fixtures would be of the inverted type; and with the horizontal burner the possibilities are almost unlimited, as the burner can be either concealed or made part of the design, and the products of combustion can be easily directed or controlled. Two recent applications of the horizontal burner are shown in Figs. 2 and 10, where the burner is the least conspicuous but the most important feature of the design.

Discoloration.—Discoloration has two distinct phases, occurring either on the fixture or on the ceiling and walls. The former is produced by incomplete combustion, by the heat of the products of combustion, and by the presence of ammonia or sulphur. Ceiling discoloration comes from any or all of the above, and in addition may be caused by the action of hot air currents carrying dust to the ceiling or walls where it is deposited. This latter action may be noted on walls above steam radiators where no combustion takes places.

The worst troubles from fixture discoloration are with the inverted type of burner, and the way to avoid it is to arrange to discharge the products of combustion in such a way that they will not impinge upon the burner or fixture parts.

Ceiling discoloration can best be avoided by using fixtures designed so that the products do not pass straight upwards; or with burners having exits designed to discharge the products outwardly as well as up.

A simple way of avoiding discoloration is shown in Fig. 2, a fixture designed by the writer for the one-mantle horizontal burner. In the lamp shown in Fig. 2, there is no stack, and the products of combustion leave the lamp at the wide rim about the center line. It will be noted that this is original in construction, as in lamps shown in Figs. 5, 6, 15, 16 and 17, the products leave at the top.

Efficiency.—The question of efficiency in light production is one of flame temperature, of the shape of the bunsen flame and of the nearness of fit of the mantle to the flame shape. In general it may be stated that the inverted burner is of higher efficiency than the upright, and the smaller the inverted the higher the efficiency. The reasons are that with the small inverted burner, a stiff, well defined inner cone can be obtained and maintained at low pressure; and with a small mantle the shape can be made to conform more closely to the flame, so that combustion takes place at the outer surface of the mantle mesh. Coincident with the high efficiency of the small mantle burner, we have greater strength of the mantle itself.

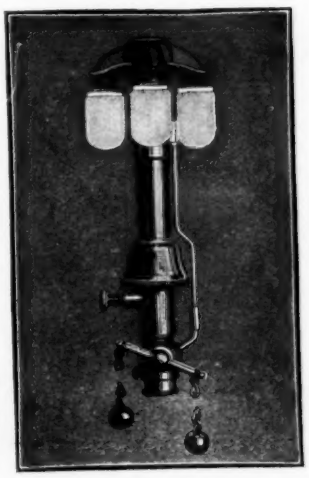

Fig. 4.—The C.E..Z the greatest Novelty of the Year.

Another means of efficiency lies in heating the mixture of air and gas before it reaches the noozle, and for this two methods are used. In the units shown in Figs. 4, 5, 6, 15, 16 and 17 the products of combustion pass upwards and impinge against the gas ways, heating them. In Figs. 1 and 7 the products circulate to the top of the burner inside of the shell, and then descend to the openings in the center ring, when they escape. The limit to which the mixture may be heated successfully is not high, and many burners have failed for the reason that the mixture was overheated.

Standardization.—After a century of progress only one detail in gas lighting has been standardized, the cock used on fixtures. The standard cock has met with favor, and is quite generally used by gas companies, and occasionally by others. Mantles by common consent have gotten down to a fairly uniform size as to ring supports, and they could be standardized with little effort. On account of the large number of designs available in electric glassware, burners fitting that size would have better commercial opportunity, but each new gas burner seems to bring a new size in glassware.

Ignition and Control.—Accessories in gas lighting have not had a marked influence upon the effectiveness of the units. We have no ignition systems other than pilots that have gotten much beyond the display room of the gas company. We have no control systems for domestic lighting, but one item in the long list of possibilities which has found a place of usefulness is the electric valve, used in connection with outside gas arcs. The need for it is because the gas must be controlled close to the point of ignition, and as outside lamps are hung high, a hand operated cock at the lamp is impracticable.

Combination Fixtures.—There is hardly a building in the coun-

Fig. 5.—Baby Inverted.

Fig. 6.—Another Stack Lamp, Medium Size.

Fig. 7.—The Regenerative Stack.

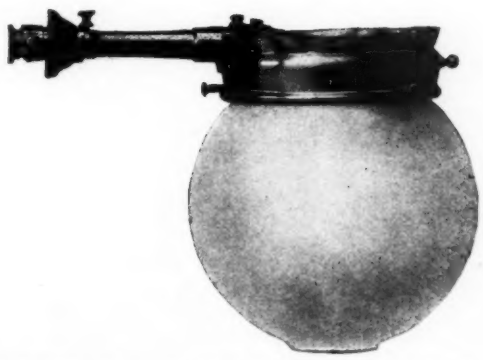

Fig. 8.—The Bray, First Horizontal Burner (English).

try, erected during the last 20 years, that has not one or more combination fixtures.

This type of fixture has been maligned and slammed by every class and condition of man and women. It survives, however, much to the advantage of gas, for in the real modern office building, hotel and apartment, we find only electric fixtures. This is unfortunate, because with the combination fixture we find that gas is used in place of electricity on at least an even basis.

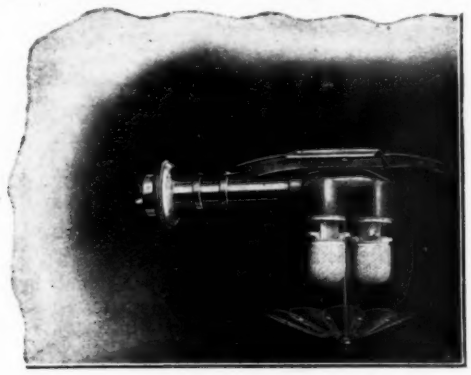

Fig. 9.—American Horizontal Burner.

The fixtures shown in Figs. 2, 11, 13 and 14 can be made in combination so that few could tell which illuminant is being used. Unfortunately these types are not being sold for new buildings, and what this will mean to gas lighting 10 years hence the reader may judge.

Glassware.—Good lighting means good glassware, for no matter how efficient the burner, the light from the mantle must be shaded. While fabrics may and are used as shades, the greatest number are

Fig. 10.—All Glass and a Burner.

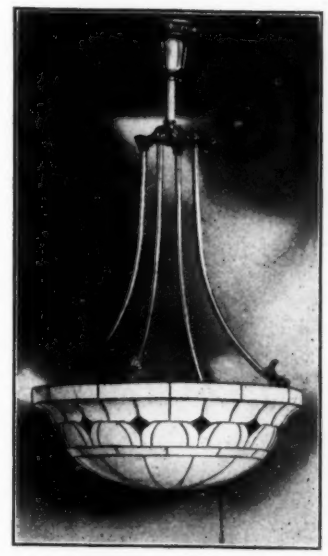

Fig. 11.—Semi-Indirect using Burner in Fig: 9.

of glassware. Lighting glassware is of four types, blown, mould blown, cast or moulded and bent. The characteristics are that the blown type is generally confined to the ball or stalactite shapes; the mould blown is thin and delicate; the cast or molded is thick and heavy; and the bent glass is used in leaded designs, although hemispherical dishes have been bent from single sheets of glass up to 20 inches in diameter.

Most lighting glassware is clear or opal, or a combination of the two. When using clear glass diffusion is obtained by sand blasting or acid etching the surface (crystal roughed inside C.R.I., crystal roughed outside C.R.O.), or by etching the outer surface

Fig. 12.—Semi-Indirect with Inverted Lamp on Center Stem.

Fig. 13.—No Center Stem, Gas Chain and Horizontal Burner.

with a design. These, however, only partially diffuse the light, and the source of light will be at least distinguishable. The objection to that can be overcome by blowing with the clear glass a thin film of opal, usually on the inner surface of the clear glass, although it may be placed on either or both surfaces. Cased or

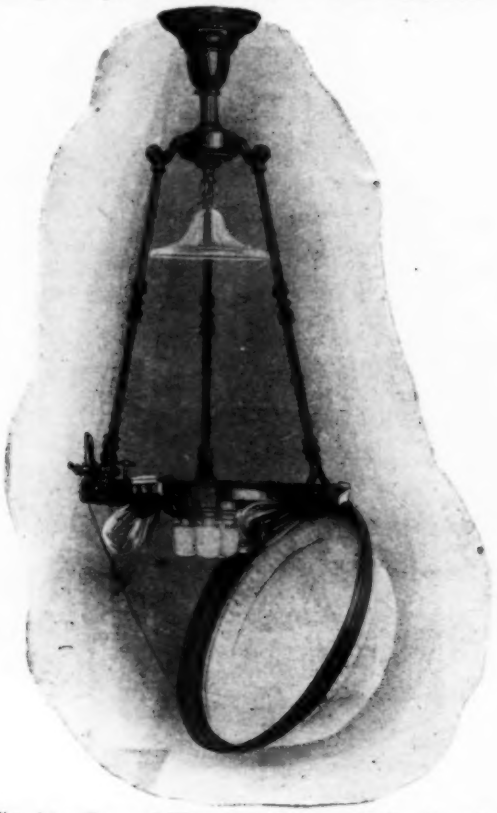

Fig. 14.—Gas and Electric in Successful Combination.

Fig. 15.—A Great Maintenance Unit.

Fig. 16.—Ornamental Type, Store Unit.

alabaster is the trade name for this type of glass. Another finish, known in the trade as translucent, gives the same lighting effect as the C. R. I., described above. The appearance of this type unlighted is dead gray speckled with air holes.

The most popular glass is the solid opal or dead white. With it we can obtain all the diffusion of cased glass and almost any required absorption.

Bent glass is obtained in an unlimited variety of colors. The colors principally used for lighting glassware are opal (white), amber and green. With the opal we can obtain all the diffusion of cast or blown glass, and with it a series of refractory "rainbows." Its great utility lies in the ease with which it may be bent and leaded into shades, bowls, etc., from the small junior shades up to immense semi-indirect bowls four and even six feet in diameter.

Style.—In developing new burners, fixtures, etc., the question of style, that ever changing axiom of the public taste, must be considered. If we use the style in women's apparel, we require something new and different every few months; in men's apparel this can be extended to twice a year; for electric fixtures once in five years; and in gas fixtures, once in ten years. The remarkable dominance of the gas arc for over 15 years has no counterpart in other lines, and it can hardly expect to be duplicated in the gas business.

Semi-indirect lighting is just beginning to get a good start in gas, while in electric lighting it is already being hard pushed by a number of forms of diffused direct lighting.

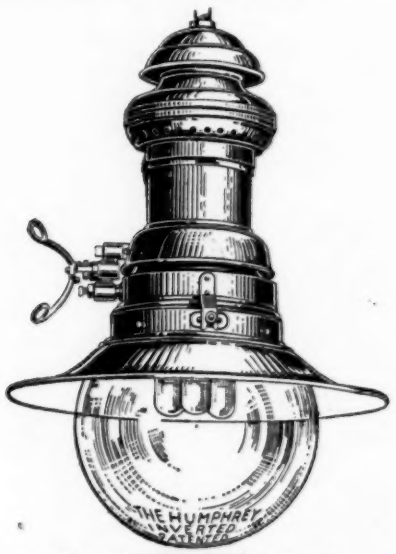

Fig. 17.—The Outdoor Lamp.

Art.—The architectural requirements of lighting have yet to be promulgated. In classic buildings no attempt is made to reproduce the lighting effects of Greece and Rome, and, except for the French and Flemish periods, and the bracket lighting of the English schools, we have little to draw from.

The marked influence of the French upon our architecture is also noticeable in lighting. The first issue of the JOURNAL, under date of July 1, 1859, contains 3 advertisements of gas fixtures, and it is interesting to note that the two firms selling *Paris* designs are still in business.

DARDONVILLE,
IMPORTER OF
Paris Bronzes, Gas Fixtures, Carcel Lamps, &c.
FRENCH RAPE SEED OIL FOR SALE
No. 623 BROADWAY, NEW YORK.

FELLOWS, HOFFMAN & CO.,
Elegant Gas Light Fixtures of every style and pattern made to order.
No. 74 BEEKMAN STREET, NEW YORK.

TIFFANY & CO.,
JEWELLERS AND IMPORTERS OF
ELEGANT ARTISTIC PARIS GAS CHANDELIERS,
BRACKETS, PENDANTS, &C., IN BRONZE AND GILT.
No. 550 Broadway, New York.

Any art that modern fixtures show is that of line, material and workmanship, quite independent of the use to which they are put.

Probably the best example of this phase of designing is seen in the semi-indirect types, so popular at present. Whether they fill a place in their environment that pleases the ultra æsthetic, they almost always supply "good lighting."

Light and the Eye.—The most important "don't" in modern lighting is, "don't let your light shine unshaded." With temperature the controlling power in light efficiency, with each increase in efficiency we have a decrease in the size of the source and an increase in the intrinsic brilliancy (candle power per square inch).

When lights are placed within the line of vision, the lower the intrinsic brilliancy, the greater the comfort of vision. In practice, this means that all lights for home use should be shaded, and in stores where the lights are hung low.

Gas Companies Should Sell Fixtures.—An encouraging feature of the gas lighting business is the number of companies who sell lighting fixtures. In these cases the public are quite well informed as to the possibilities of gas lighting, and the fixtures they sell make gas lighting consumers. Contrary to the general belief, they sell more fixtures on merit than on price considerations. When gas companies do not handle fixtures the lighting business is on the wane, as the public never see modern gas fixtures, as no dealers will carry them.

Strange as it may seem, many of the companies that do not use this means of furthering this valuable feature of their business are noted for progressiveness in other directions. If gas lighting is to prosper these men must be gotten into the work, and have everyone be a gas lighting enthusiast.

The Production of Silica.

The quantity of quartz or other siliceous materials marketed in 1914 for the manufacture of pottery, paints, wood fillers, polishers, and refractories, was 181,781 short tons, valued at $612,829, as reported by the U. S. Geological Survey. The following is a list of States and the kinds of materials produced in each:

Arizona: Quartz.
California: Quartz and diatomaceous earth.
Connecticut: Quartz and diatomaceous earth.
Illinois: Tripoli, sand and sandstone.
Maine: Quartz.
Maryland: Quartz and diatomaceous earth.
Massachusetts: Quartz.
Michigan: Quartz.
Missouri: Tripoli.
Nevada: Diatomaceous earth.
New York: Diatomaceous earth.
North Carolina: Quartz.
South Dakota: Quartz.

An Attractive Booklet for Gas Consumers.

"Mutual Service," is the title of a well illustrated booklet, that is destined to reach the homes of many gas consumers. The author, Miss Carolyn Putnam Webber, "teacher of cooking," and favorably known to the fraternity for her lectures and demonstrations, has combined suggestions in recipies, for the avoidance of indigestion by day, and for its promotion by tempting delicacies by night, with methods and practice which bring the best results with gas. The little "brocure," as it will be described by the literary advertisement writers now forging to the front in our gas companies, contains numerous illustrations of gas appliances and plenty of sound readable matter on their operation.

Miss Webber states that through demonstration lecture courses, given for many gas companies for the past eight years, she has learned that the lack of a thorough understanding of gas often results in a small consumption on an all-ready installed appliance, especially a range, as its full capacity is not used, or its wrong handling may have proven expensive, and so its use been curtailed, or, in part, discontinued.

The repeated inquiries from consumers have influenced her to prepare this book, treating gas appliances, their selection, economical use, care and adjustment, also with recipes practical for the gas range. Some companies will distribute it among all range users, others will give one with each range sold.

The appliances illustrated and described include lamps, fixtures, ranges and water heaters, and we suggest that future editions might include table toasters, percolators, chafing dishes, room heaters and incinerators. The books are made up with stiff paper covers, and the title page is left for use with the gas company's imprint. We commend them to the industry and trust that the author's efforts will be so much appreciated that many editions will be needed to supply the demand.

Correspondence.

The JOURNAL is not responsible for the opinions expressed by correspondents.

Why Valuations Differ.

September 11th, 1915.

DEAR JOURNAL—In the JOURNAL for September 6th, page 159, it was stated that A. S. B. Little, for the State Commission of Illinois, had placed the value on the plant of the Springfield Gas Company at $734,698, a decrease from the company's figures of more than $200,000. It should be explained this does not represent all the property, whereas the valuation of the other engineers include everything tangible.

The valuation of J. A. Brown, in the employ of Hodenpyl-Hardy and Company, the operating company that controls the Springfield Gas Company, was based upon a strictly "cost to reproduce" method, so that average values for the past five (5) years were used. The same method was followed by Professor Anderson, of Michigan, employed by the company to put in a valuation. The basis used by the engineer for the commission was "original cost." In this way the commission will have for consideration the cost to reproduce the plant, as it now is, if it were to be constructed at the present time; and will also have, in the other case, a valuation that shows the cost of a similar plant constructed in the way it was built, using, wherever possible, the actual contract prices and additional costs incurred in assembling the units.

It can readily be seen that these two systems of appraising are bound to bring different results, not only because the cost of material varies in the different years during which the plant was constructed, but because in estimating the cost to reproduce the plant at the present time, it is necessary to consider the building up of the property as a whole. This means estimating the overhead expenses for engineering, etc., at a higher rate than would be estimated for a plant built up piecemeal. In this connection it might be said that Little's depreciated overhead expenses amounted to $93,109; J. A. Brown showed $144,570; Professor Anderson, $177,301; Alton D. Adams, $34,506.

In the figures given in your issue of September 6, Little's value of $734,698 was exclusive of land. If the land value used by Brown and Anderson is added to this figure, the total would be $790,498.

There is another thing to be considered, and that is the "working capital," suggested by the engineer of the commission, which was $26,160, whereas Brown suggested $39,000, and Professor Anderson $38,437. The valuation of tangible property, with land included at value shown by the company, would be, Little, $818,458; Brown, $940,988; Anderson, $898,785; Adams, $547,448; Bemis, $588,262. Yours very truly, PRO BONO PUBLICO.

PRESIDENTIAL ADDRESS OF A. S. McALLISTER, I. E. S.

Simplification of Illumination Calculations.

As marking the transition of the science and art of illumination, from the methods of the physicist to those of the engineer, no one milestone stands out more prominently than that represented by the presidential address of Dr. Clayton S. Sharp, in 1907. Following his presentation of certain concepts and terminology in illuminating engineering, not only was there a change in the output rating of lamps from the indefinite and much abused candle-power to the definite and now well-understood lumen, but many improved methods were developed for solving problems in illumination. In many respects the results have been similar to the substitution of the flux method for the isolated unit pole method of solving problems in magnetism.

While from the point of view of physics, there are marked differences between the concept of magnetic lines or "tubes" of force and that of lines or "cones" of radient energy, yet in their mathematical treatment the problems relating to the one are quite similar to those relating to the other.

So far as numerical results are concerned, it is absolutely safe to ignore the direction of travel and mode of propagation of the radiant energy, from the source of light to the surfaces upon which this energy is absorbed. Of one relation we can be absolutely sure, namely, the total enery adsorbed equals the total energy produced.

When methods of calculation give results not in conformity with this relation, it is safe to state that the methods are wrong, either in principle or application. Thus, for checking results obtained by laborious methods, the absorption of light method is highly advantageous. In many instances, yes, in most cases, it is permissible to abandon the more complicated methods and rely upon the simplest and absolutely correct energy-ratio method, with merely an occasional reference to some more indirect method, for determining space distribution of the illumination, where this is of importance.

Looking back over the transactions of the Illuminating Engineering Society since its first meeting, in 1906, one cannot but be impressed by the fact that almost all of the solutions offered for problems in illumination have been based on the tacit assumption of point sources rather than surface sources. Even when dealing with plain surface sources, the authors have usually treated them as made up of an indefinate number of point sources, arranged in one plane, and have based their solutions on the "inverse square" law and other relations developed from the fundamental point-source conception. In order to obtain results consistent with the known facts in this case, it has been necessary to assign to each infinitesimal point source in the plane, certain physical characteristics not possessed by ideal point sources—that is, the ability to produce light in only one hemisphere, which is the fundamental attribute of an infinitesimal plane surface source.

It needs no argument to show that all calculations are immensely simplified by adopting initially the surface source conception and utilizing at once the well-known relations developed for surface sources.

Instead of determining the illumination produced by the source on a chosen plane by reference to the "inverse square" law and the integrated "candle power," the identical value can be derived more conveniently by means of the fundamental ratio existing between the "apparent luminous density" of the source and the lumen density on the surface illuminated, which ratio depends solely upon the solid angle subtended by the source when viewed from the chosen plane.

Allow me to call attention, at this point, to a fact learned in our school days, but generally forgotten since then; namely, the extreme ease with which solid angular relations can be represented by straight lines and circles in planes. As a result of this fact, simple circle diagrams can be utilized for solving graphically problems in solid angular relations, the solutions of which are very complicated when any other method is employed.

Ignoring for the moment the physical interpretation of the change in conception from the "point" to the "surface" source, allow me to mention here the significant fact that the solution of a problem, when based on the one conception, is identical with that found when the other conception is employed, so that any errors which may be attributed to the one conception must likewise be urged against the other.

When dealing with the surface sources, it is necessary to take into consideration the fact that not all surfaces obey the so-called "cosine law" of emission in accordance with which a surface would appear uniformly bright when viewed from all possible locations. However, it is equally necessary to take into consideration the fact that the candle-power from a so-called point source or the "apparent candle-power per unit area," from a surface source, is not uniform in all directions in space. The fact of the matter is that all practical sources omit light in such a way as to appear non-uniform in brightness over the surface when viewed from any one locality, and any one point on the surface apparently varies in brightness when viewed from different locations in space. It is impossible so to express the brightness that its value will not be subjected to the changes here referred to.

If the surface were identically perfect in its emission, its brightness would be everywhere equal and uniform, and its apparent candle-power would vary with the cosine of the angle of deviation of the surface from normal to the line of vision; that is, the surface would obey Lambert's "cosine law of emission." A surface which is not identically perfect in emission can be compared directly with one following the cosine law of emission irrespective of the units in which the outputs or appearances are expressed.

For convenience in calculation and purpose of comparison, it is advantageous to express the outputs in terms of the lumens, and the output density in terms of the lumens per unit area. It is equally as convenient and logical to express the appearance in terms of the luminous output density, selecting for the unit the appearance of a surface emitting in accordance with Lambert's cosine law. For this unit of appearance there has happily been suggested the term "lambert," which is applied to the appearance of a surface emitting one lumen per square centimeter, in accordance with Lambert's cosine law of distribution; it is equivalent in appearance to that of a perfect matt surface of 100% reflecting power, illuminated with a density of one lumen per square centimeter.

Although the introduction of the lambert brightness unit is of recent date, it is noteworthy that its exact physical definition was accurately presented before this Society 8 years ago, in the presidential address of Dr. Sharp, who stated therein that "the brightness of a diffusely reflecting or transmitting surface, is proportional to the luminous flux which it emits per unit of area."

In view of the fact that the lambert unit is based on the surface source conception, this method of expressing the brightness (that is, the appearance to the eye), seems to me to be fundamentally much more logical than the more common method involving a reference to the point source conception. It is impossible to derive an expression of brightness which does not in some way—either directly or indirectly—involve the luminous output and the surface area. That is to say, when the expression of brightness includes a reference to the point source conception, it is evident at once that there has been assigned to each infinitesimal point source, physical characteristics possessed exclusively by a surface source. Simplicity, in both conception and mathematical analysis, dictate the reference of all brightness expressions directly, rather than indirectly, to surface sources, and not to point sources.

Problems relating to both the output and the appearance of practical lighting sources are greatly simplified when use is made of the real surface source conception rather than the fictitious point source conception.

Independent in every respect of the units employed in expressing the output and the appearance of a surface source, it is essential to recognize the fact that only in the case of emission in accordance with Lambert's cosine law is either the output density or the appearance uniform over the surface. For simplicity in calculation, it is advantageous to assign such values to these variables that the calculations will give results in practical accord with the actual facts. The mean value of the output density can evidently be found by dividing the total output by the total area of the emitting surface; this value is identical with the mean effective value of the "appearance" or "brightness" of the same source.

For all practical purposes the use of the mean effective value of the brightness introduces errors no greater than those caused by substituting the mean effective value of an alternating current for its cyclically varying value. That is to say, problems in illumination from surface sources—and practically all sources are surfaces—are simplified by substituting the mean effective value of the output density and appearance for the actual values with variations in space, in exactly the same manner and to the same extent as equivalent problems in alternating current phenomena are simplified

by substituting the mean effective value of the alternating current for the actual values with variations in time.

Let us carry the physical analogies somewhat further. The substitution of the lumen conception for the candle power conception has simplified illumination calculations just as the substitution of the magnetic flux conception for the isolated magnetic pole conception has simplified magnetic circuit calculations. Moreover, the use of the surface source conception, rather than the point source conception, permits of the introduction of graphical methods for solving problems in illumination equally as accurate and convenient as the simplified circle diagrams now universally employed in solving problems relating to the general alternating-current transformer.

To persons familiar with the time-honored laborious calculating methods of the electro-physicist and with the short-cut but equally accurate methods of the present-day electrical engineer, no arguments need be presented in favor of the simplified methods of solving problems in illumination other than the analogies just outlined.

N. C. G. A. Salesmans' Handbook.

The N. C. G. A. handbook is to include general descriptions of all gas appliances in common use, so far as types rather than specific appliances may be described, the proper methods of installation of each appliance and the conditions under which appliance may be properly used.

It is also desired to incorporate in the book as supplementary information:

1st. Records of specific installations of appliances.

2nd. Data; such as tables of capacities and other information concerning appliances, the installation and operation of appliances and of the material or conditions with which the appliances have to do.

3rd. Condensed catalogue; descriptive matter of the appliances which the various manufacturers offer for sale.

4th. An index of appliances, with their manufacturers' and trade names.

The committee desires any data or information that manufacturers deem essential or desirable to aid in securing sale, installation or successful operation of their appliances.

The Association is prepared to undertake the printing of the handbook pages which manufacturers may wish to furnish, at cost.

Rules for the Guidance of Manufacturers in Preparing Pages.

What the Salesmans' Handbook Is.—The Salesman's Handbook consists of a black, limp leather binder or cover of the type and size known as a "standard $\frac{3}{4}$", 3 ring binder;" pages for this binder to be furnished by the National Commercial Gas Association and manufacturers of gas appliances; and a box or desk file of paper board covered with cloth or leather, of the standard N. C. G. A. brown color.

Size of Sheets.—All sheets or pages furnished for the handbook by the Association and manufacturers shall be 4" wide and 7" long.

Punchings.—Pages to be punched as follows: 3 holes $\frac{3}{16}$" in diameter on the left hand 7" side; holes to be $2\frac{3}{4}$" center to center and all holes to be set in from left hand side $\frac{1}{4}$" from edge of page to center of holes. Top and bottom holes to be $\frac{3}{4}$" from top and bottom of page respectively.

Color Index.—A suitable color index will be arranged. Details are not yet decided upon.

Numerical Index.—A numerical index providing for quick reference will be arranged later. Details are now decided upon.

Inter-Changeability.—The size of the pages and binder are such as to be inter-changeable with the pages of the Electrical Solicitors Handbook, published by the Commercial Section of the National Electric Light Association. Confusion between gas pages and electrical pages will be obviated by the fact, that the gas pages will have rounded corners while the electrical pages have square corners.

Subject Matter.—Bearing in mind the character of the handbook, that of a data book or reference book of authoritative information, it will be apparent that all statements made, or descriptive matter written for the book must be condensed to the briefest form that will serve the purpose; and must be free from exaggerated claims or other inaccuracies, which in all lines of business are sometimes considered not inconsistent with truthfulness in advertising matter intended for the public.

The pages of this book are not intended for the public, but for salesmen of gas appliances. Any statement made on pages of this book must be regarded in the same light as a guarantee for the performance of the appliance to which it refers.

The descriptive matter regarding the appliance described should be only that which is essential to make the purpose and operation of the appliance clear to the mind of the reader.

If selling points for the instruction of salesmen are considered essential they may be included, provided they are frankly given as such, are so headed, and are not detrimental by their statements or implications to appliances of other makers.

THE

SIZE ADOPTED FOR

N. C. G. A.

SALESMANS' HANDBOOK

IS

4 INCHES BY 7 INCHES

Much data is at hand and if manufacturers reply promptly the book will be ready in time for the

WASHINGTON CONVENTION

C. Edwin Bartlett, Chairman.

It is desirable in all cases that full information of each appliance be given on the following points, using one sheet for each separate and distinct type of appliance manufactured:

A. Name and address of manufacture.
1. Type of appliance.
2. Trade name.
3. Statement of functions.
4. Table of sizes made.
5. Sizes carried in stock.
6. Special sizes built.
7. List prices.
8. Dimensions—very complete.
9. Weight, net weight and shipping weight.
10. Capacity—definite statement, if possible.
11. Consumption of gas, total and in detail.
12. Installation specifications.
13. How to order.
14. Time needed for shipment.

Procedure.—Material or copy of the proposed page or pages must be sent to the committee in quadruplicate. The committee will go over this material promptly and return one copy approved, or with such suggested changes as will secure approval when they are made. Such changes, if acceptable to the manufacturer, should be made at once to secure prompt approval.

THE AMERICAN GAS LIGHT JOURNAL

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E. P. CALLENDER, - President and Treasurer.
F. A. SOUTHWORTH, - - - - Vice President.
CHARLES H. WADELTON, Secretary and Manager.

SANFORD K. CAMPBELL, Editor.

NEW YORK, MONDAY, SEPTEMBER 27, 1915.

Lighting Week.

The use of gas for lighting is at a critical period, owing to circumstance far removed from the value of its application. The burners, mantles, lamps, fixtures and accessories, described by Mr. Thurston Owens, on other pages in this issue, show that the chemist, the engineer and the artisan are producing appliances mechanically better, of greater beauty and of higher continuous efficiency. But remarkable as it may seem, of the better grades of gas lighting equipment, practically none are being handled by dealers generally, and only by a very few gas companies.

These gas companies that sell all types of lighting equipment have, as a rule, made a success of this department, and where such has not been the case, it has rarely been due to lack of merit of the merchandize.

For a number of years most combination companies frowned upon any stimulus to gas lighting, as they were developing their electric lighting loads. We are glad to state that this condition of mind is passing, owing largely to the facts brought out by a study of each month's operating statements. The gas lighting load is important from the standpoint of revenue, and were, say, half of it lost, there is no other application of gas available that could fill the gap immediately.

In localities where there is little gas lighting, there will be little piping done in new buildings, and when a building is constructed without gas piping, a potential consumer for heating service is practically lost.

People who scoff at gas lighting, and there are many who dub it "old fashioned," should pause and consider that for 25 years it has prospered upon a laboratory discovery that one metallic oxide had different characteristics from others investigated.

May we not expect another discovery? Whether or not there is anything strikingly new coming in the near future, we hope that Lighting Week will prove an inspiration to some of the faint hearted and a guide for extending the use of gas as an illuminant.

Canadian Gas Men Meet—Eighth Annual Convention at Montreal, Canada.

The entertainment arranged for the evening of the first day consisted of a Smoking Concert for the gentlemen, the ladies attending the Arena, where they listened to a splendid concert by Creatore's band. After the return of the ladies from the concert, a supper was served at 11:00 P.M. for both the ladies and gentlemen.

Friday morning's session opened at 9:30 with the reading and discussion of papers. The following papers were then proceeded with:

"The Value of Mechanical or Other Indicating or Recording Appliances in Connection with the Several Operations of a Gas Plant," by Mr. Wilfrid Philpot.

"Routine of Billing and Receiving Department," by Mr. W. P. Baird.

"What Policy is Being Adopted by Gas Companies to Meet Electric Cooking Competition?" by Mr. V. S. McIntyre.

All of which were well received and discussed with interest. Just before the last paper was introduced, President Mann informed the convention that he had a surprise, the nature of which was a paper on the "Upkeep of Mechanical Units in Large Gas Plants." The paper by Mr. J. A. Jeffries, and was a wonder as so thoroughly was the subject covered that no one could do anything other than accept the statements, because they were true. It was the sense of the members that this paper should be accepted by the association, and a copy placed in the hands of every member, as the matter contained in the paper is unique and of such great value.

At this point, there being no further business, the President thanked the convention for the honor conferred, and the support that he had received during the past year. A vote of thanks was also extended to Messrs. Johnson and Bagg for their splendid work on the entertainment committee.

President Mann thereupon spoke for the same consideration and support for his successor, Mr. Wallace. Mr. Wallace thanked the paper committee for the high grade of papers.

Mr. Mathews, of the Quebec Company, extended a cordial invitation to the Association to meet in Quebec next year, which was accepted.

There being no further business, the convention adjourned.

At 1:30 P.M. the members, visitors and ladies took a train at the Grand Trunk Station for the Beaconsfield Golf Grounds, at Pt. Claire, where luncheon was served at 3 P.M. A number of toasts of a complimentary and pleasant nature were offered and responded to, and at 5 P.M. a return to the city was made. Those who were privileged to go, and there were almost 100, lunched on a long porch that looked out on beautiful golf grounds, points of a small village with the broad and mighty St. Lawrence in the distance, a magnificent panorama of natural beauty.

It might be well to state at this point that Mr. Mann, the retiring president, who has attained a great measure of success in Montreal, is an American, formerly Gas Engineer of the old Cleveland Gas Light Company, and went to Montreal after the Cleveland Company was turned over to natural gas interests. Those who know Mr. Mann will not be surprised to find how popular he is in Canada. It might not be improper to say, in a spirit of strict neutrality, that Mr. Mann has only been loaned to Montreal, and as to how long, will depend upon just how they appreciate him.

The Eighth Annual Meeting of the Association is now history, but the pleasure, goodfellowship and kindness received by these who attended, as guests, will be remembered for many a day. The ladies particularly contributed a good share of the pleasure.—W.

Illuminating Engineering Society, Ninth Annual Convention.

Hotel Willard, Washington, D. C.

Sunny skies and smiles greeted us at the opening exercises of the I. E. S., and the number of ladies present made the quantity of smiles worth reporting. At the appointed hour, 10:30, Mr. J. C. McLaughlin, of the Entertainment Committee, introduced Corporation Counsel, Mr. Conrad Syme, who suggested that the week's doings be guided by the "Inner light,"

In responding, Mr. P. S. Millar cleverly stated that if the many quotations and inscriptions found in buildings of public nature and on monuments, etc., were followed, this light could be attained.

The presidential address of Dr. A. S. McAllister departed from the prosaic admonitions of numberless precedent, and made a definite plea for a less complicated method of ilumination calculations.

The purport of the Code of Lighting for factories, mills and other work places, as prepared by a committee, was given by Chairman L. B. Marks, and accepted, as read, subject to written suggestions. The same method was used in handling the report of the Committee on Progress, read by Mr. F. E. Cady. This latter is notable for its appaling number of references (211); and as far as gas is concerned, for its lack of real or up-to-date information and its loose method of presentation. One example may suffice:

"A great advance has been made in gas fittings. The old "goose neck," fastened with a wire, is being replaced by straight pipe, tubing with gas-tight adjustable couplings, which make a variety of brackets available."

The report of the Committee on Research, read by Dr. E. B. Rosa, had to do with Heterochomatic Photometry. The discussion was of the complimentary order and ended the morning session.

MONDAY—AFTERNOON SESSION.

When Dr. McAllister called upon Dr. C. H. Sharp to read the report of the Committee on Nomenclature and Standards there was a perceptible buzz, as every one was trying to locate his copy of the paper, and its hard to find one amongst thirty odd; this being a record breaker as to the number of offerings. The report contains several new units and some definitions not heretofore standardized.

Discussing "The Specific Output of Illuminants Depending upon Combustion Should be Stated in Lumens per B. T. U. per Hour." Mr. R. ff. Pierce contended that this was wrong, and said that while the relations between specific output and calorific value have not been definitely determined, the present presumption is strongly against the assumption that the output per B. T. U.'s tends to assume a constant value, but that the output per cubic foot is more nearly an unvarying quantity. The recommendations should be made in such a way as to eliminate the possibility of confusion in commercial application, which would follow the use of the output B. T. U. as a basis of rating for gas lamps. He called the attention of the committee to the fact that the rating of gas lamps in terms of light output per B. T. U., as recommended, is likely to result in confusion if an attempt is made to apply it to commercial practice. Valuable as it may be as an expression of light output per unit of energy, it has no practical usefulness. Such investigations as have been reported indicate that one cubic foot of gas of 500 B. T. U.'s will produce as much light as one cubic foot of gas of 600 B. T. U.'s, because of the higher flame temperature produced by the gas of lower calorific value.

The second paper, "Illumination Efficiencies as Determined in an Experimental Room," by W. Harrison and E. A. Anderson, was read by the former, and the discussion,which was of little interest, was closed by the latter.

A description of a successful installation of semi-indirect lighting in the Chicago Edison Building, by W. A. Durgin and J. B. Jackson, was then given by the former. The units selected allow only 11% of the light flux to be emitted downward, which means that their intrinsic brightness is only three times that of the ceiling. The discussion by Messrs, Vaughn, Moulton, Cravath, Burrows and Pierce brought out the fact that the public demanded an opposite condition, and that fixtures with great brightness were the big sellers.

The closing report was of special nature, by Mr. C. L. Law, giving the results with the Type "C" lamp, as to sizes, breakage and use. Ninety per cent. were sold for interior use and 55% of these were of the 200 watt size.

The registration numbers over 100, and more are arriving hourly.

Entertainment.—The ladies, and a number of truants, enjoyed a lengthy bus ride during the afternoon, and after an early dinner all assembled in the Ball Room and sat through a vaudeville show, which was substituted, or shall we say perpetrated, in place of the President's reception. The dancing, however, began early and lasted early, ending a rather strenuous first day. Souvenirs for the ladies did not go begging, as they were handsome spoons of hammered silver, with the I. E. S. badge as a crest.

TUESDAY—MORNING SESSION.

Even with the hour of starting at 9:30 over half of those attending were present to hear Mr. W. F. Little read his paper setting up a standard of practice for the use of Portable Photometers, although, with his usual modesty, the title called them "hints." The discussion by Messrs. Durgin, Porter, Millar, Rose, Macbeth and Stickney indicates that brightness measurements will largely replace illumination figures, and that the horizontal plane will receive less consideration. A new compensated test plate for illumination photometers was described by Dr. C. H. Sharp and Mr. W. F. Little in a paper read by the former. The discussion was of the appreciative order and the plate should find a field of usefulness.

Reception by President Wilson.—The morning session was curtailed so that the society could attend a handshaking reception at the White House at noon. Nearly 150 members and guests were received by the President in the East Room, and the careworn features of our Nation's head spoke volumes as to the trying and exacting duties he has so successfully fulfilled. Following the reception another picture was taken on the White House grounds.

TUESDAY—AFTERNOON SESSION.

A special session of an hour was held to care for the two papers on maritime lighting scheduled for the morning.

The "Lighting of Ships," by Mr. H. A. Hornor, was read by Mr. L. C. Porter; and a paper on the "Lighting of a Passenger Steamer," was read by the author, Mr. H. T. Spaulding. The unusual construction and the large variety of uses, including search and signal lights, etc., provide opportunities for a wide scope of both lighting and mechanical skill. This concluded the afternoon session.

Calvary Drill, Fort Myer, Va.—Three interurban cars were needed to convey the party to Fort Myer, Va., where a cavalry drill was carried out, followed by a skirmish, in which real blank cartridges were used.

TUESDAY—EVENING SESSION.

Street lighting was described from four different angles, principally with the aid of slides. The papers, which were all read before the discussion, were "Street Lighting with Gas Lamps," by Mr. Geo. S. Barrows; "Magnetite Arc Lamps," by R. C. Rogers; "Type 'C' Lamps," by Mr. W. H. Rolinson; "Milwaukee Street Lighting Plan," by Mr. F. A. Vaughn. The first three papers covered recent applications, and the last a definite recommendation, which was adopted for Milwaukee, Wis. This report is interesting in that the equipment of the posts, lanterns, etc., can be used with either gas or electricity as the illuminant.

Past-President P. S. Millar had charge of this session and the discussion was opened by President-elect C. P. Steinmetz. In view of the large number of points involved and the lack of time, the discussion was more or less desultory.

Immediately after the session the members were taken by auto bus to the Capitol, the Congressional Library and the Post Office, which were kept open for the inspection, and after a trip covering some of the best lighted streets, the members retired, after a second day of strenuous activity.

The Wednesday and Thursday sessions, and the Banquet, were all held as per schedule, and will be described in later issues. The total attendance was 300, of whom 30 were gas men.—T.

[Special Telegraphic Report.]

THE 24TH ANNUAL MEETING OF THE MICHIGAN GAS ASSOCIATION.

DETROIT, MICH., Sept. 23, 1915.

About fifty men arrived last evening for Gettogether Meetings at clubs, theatre parties, etc. Meeting opened 9:30 to-day with address by President John T. Young. He emphasized high fraternal spirit in gas business and in Michigan Association. He said in part, "It requires competent, patient and courteous men to explain, compromise or otherwise satisfy and harmonize the differences that arise between seller and purchaser in any commodity, and especially in the case of a public utility, which is a monopoly by nature. In this day of advanced ethics in the business world, it is possible to build a character for the gas company that is willing to pursue a broad minded policy towards its customers. Constantly educating the public to a friendly attitude by efficient service, and paying close attention to all details that go to make up courteous treatment to all its consumers, this Association purports to develop a more cordial relation between its member companies and the consumers of gas. Whatever it has or may accomplish in this line must come as a result growing out of the influence of the Association to develop and educate the members."

Followed by Secretary's report was the report of Scholarship Committee, read by John W. Batten. The convention disposed of some routine matters and then proceeded with the first paper, "High Pressure Distribution for Small Towns," by Ralph B. Warner, read by Albert G, Schroeder, which brought out considerable discussion, and caused a special meeting to be called this afternoon of those particularly interested, to continue the discussion on high pressure systems. The next paper, "The Welfare and Training of Employees," by C. L. Palmer, was discussed at length by E. F. Lloyd. Meeting adjourned at noon. Unique beef banquet was held at Hotel Statler, 7:30 P.M., 200 in attendance. Speakers as in announcement, also Fred Statler, head of Statler Hotels, and Homer Warren, former Postmaster of Detroit; room wasgaily decorated by Japanese umbrellas in center of each of the 25 small round tables, and whole room festooned with serpentine paper. Drill by Boy Scout Troop, about 50 boys, was a unique feature of the program. Original song hits, written for the occasion, by R. C. Fowler and Harvey Campau. Election Friday morning.—F.

SPECIAL ENGLISH CORRESPONDENCE.

Monthly Letter From Norton H. Humphrys, Salisbury, England.

GAS BUSINESS UNDER WAR CLOUDS.—SCOTTS' PRESSURE RAISING DEVICE.

Last month, I offered some observations on the business done by the London Gas Companies during the 6 months ended June 30th, 1915, and now propose to supplement the same with some reflections suggested by Statement of Account covering the same period, as issued by the directors of various gas undertakings throughout the United Kingdom,together with the explanations or comments offered by the respective chairman at the meetings of shareholders. As might be expected at a time of national excitement, the utterances at the head of the table are of a very varied character, strongly tinged with the personality of the several speakers. For the most part they are of an optimistic nature, though occasionally one meets with a Jeremiah who appears more impressed with the possibilities of the immediate future, than with the achievements of the present. Both one and all, of course, make a sympathetic reference to those who, at the call of public duty, are risking their lives in the service of their country, and the wives or dependants of such have not been forgotten. There is a remarkable difference of opinion in respect to the market prospects of the staple materials, coal and oil. The explanation of the matter is that the unprecedented condition experienced during the last 12 months have affected various concerns in different ways. Without exception there has been an important loss in sales of gas throughout the country, brought about by the restrictions on public and outside lighting, on the sale of intoxicating liquors, and the earlier closing of restaurants, liquor saloons and places of amusement. In the absence of compensating influences this loss may have reached as much as 10% on the total output. But many districts have experienced a phenomenal increase, brought about by the establishment of camps, barracks, hospitals, or munition works, sufficient to more than outset the reduction. Even in important seaside places like Bournemouth or Brighton, where restriction of outside lighting is carried almost to the point of complete extinction, the total increase, as compared with the corresponding period of 1914, is in the neighborhood of 10%, and some inland towns range up to 15 or even 20. The tone of the chairman's remarks is always influenced by the extent of business done, and it is not in human nature to be unduly pessimistic in the face of a large increase in sales, or over optimistic when they show a substantial falling off. On account of the limitations put upon the issue of additional capital, many are obliged to postpone promising extensions, and others are compelled by scarcity of labor and high price of materials, to exercise a rigid censorship in the matter of additions to apparatus on hire, new main, services, etc. We already know by experience that a public supply of gas is a necessity of modern civilization, at ordinary times, and now have evidence that it is more than ever a necessity in times of war. Looking at the fact that by way of the gas works, sulphur, toluene, and other valuable constituents of coal are utilized and turned to practical account, whereas, when the coal is burnt as such, they are not only wasted, but converted into objectionable products of combustion that are a source of nuisance and death to health, it is evident that a liberal use of gas for all purposes, as a substitute of coal, is not only a personal convenience, but an act of patriotism and an assistance to the Government. Another cause in favor of gas consumption is that consumers do not fail to appreciate the fact that while coal, within the last few years, has gone up quite 50% in price, gas has not been advanced more than 10%.

One reason why the majority are able to pay full dividends with a trifling assistance in the shape of a small advance on the price of gas, in the face of a large all round increase in the price of materials of labor, is the substantial financial assistance afforded by a 10% or so increase on the rates of gas, when it takes the form of an increased average per consumer rather than addition to their number, and of an evenly dispersed increment over the whole twelve months, in preference to intermittent fits and starts. There are establishment and legal expenses with which a joint stock company must comply, irrespective of sales, profits or losses. The distribution costs are more a matter of the number of accounts on the books than of aggregate cash takings. It costs no more to index, book and account the affairs of a thousand consumers, averaging £10 a year per head, than if they only figure out at £5. The only costs that increase pro rata with the quantity of gas sold, are those for manufacture and purification. Therefore an increased rate of 10% or 15% on the lines above indicated, carries far more than a similar proportion of profit. This fact has repeatedly been cited in the past as an illustration of the advantage gained by judiciously liberal outlay on advertising, letting appliances on hire, or other methods likely to increase the output. Perhaps as much is generally understood, but even in that case it is well to note that the experiences over the last twelve months plump solidly in favor of a progressive policy.

There is another very general feature that cannot be so readily explained, and that is the absence of reference to losses on working results. One might well imagine that in addition to irregular deliveries, depreciation of coal by reason of prolonged exposure to weather in transit, weak, incompentent, unexperienced and continually changing labor (many will agree that the so-called retort house "shifts" are rightly named in more senses than one), there would be appreciable loss in the direction of low makes per ton of coal carbonized, or wastage of coke. Yet, in not a few instances, after deploring the loss of 30 to 40% in quantity, and a larger proportion as regards the quality of the staff, the report goes on to record marked improvements in working results. Notwithstanding the general advance in price of coal that obtained during the summer of 1914, which could only be very partially covered by arrears due on previous contracts, the cost of manufacturing material shows a reduction as compared with the previous year, as the cost of wages in proprotion to the make is lower. One explanation is that since petroleum is lower in price, it has displaced coal to a greater extent than formerly, and a larger proportion of carburetted water gas has been supplied, possibly as an enricher to poor coal gas. The C. W. G. house does not make such a large demand on human showing of muscle as the retort house, and the production per man is greater. The puzzling thing is the possibility, under the conditions above named, of getting a larger make per ton of coal. It may be due to the more extended use of vertical retorts, of conveying, drawing and charging machinery, and other devices by which the laboring man is to a greater or less extent displaced by the iron man.

The fact that the cupola is to a considerable extent coming into competition with the retort, and that liquid hydrocarbons are displacing coal, is calculated to have an important effect as regards the technique at the gas works. And in this connection it may be observed that coal is being superseded in many other directions, such as for road motors, railway engines and steamships. Take as an example, any principle thoroughfare in a large town. Not only is it lighted by means of gas, containing anything up to 50% of C. W.G., but of the total vehicles traversing it, more than half are petrol driven. The consumption of liquid hydrocarbon by transport vehicles, in connection with the present war, must be enormous. Some authorities have at times talked about the exhaustion of our coal supply, and urged the need for conserving it. What have they to say about the world's stock of petroleum, and how many years it will last at the present rate of consumption?

Managers of small gas works situated in out-of-the-way parts of the country, are thrown upon their own resources to a larger extent than those in charge of more extensive concerns, who have a staff of skilled artizans at their beck and call, and are within easy reach of foundries and engineering shops. They have only to decide what is to be done, and are often able to get the assistance of expert opinion before coming to a conclusion, and then give their orders.

Whereas the small works manager has not only to decide what is to be done in case of emergency, but to do it single handed, or at best with no more aid than that afforded by unskilled labor. Many excellent contrivances in regular use all over the country have originated in some simple home-made device, arranged to meet a sudden emergency. I do not know a better illustration than the pressure raising device described by Mr. James S. Scott at a recent meeting of the North British Association of Gas Managers. Mr. Scott is in charge of a straggling district, and when the local authorities decided to adopt a pressure wave system for automatically controlling the lighting and extinguishing of the public lamps, he found that the gas holders would not furnish the excess pressure required.

Under these circumstances many engineers would simply have reported that the wave system was impracticable, but Mr. Scott is evidently one of those who believe that difficulties should be conquered. After considering blowers, fans, boosters, and such like mechanical devices, his attention seems to have been directed towards the steam injector exhauster, at one time in general favor, but now rarely heard of. He arranged a by-pass main connecting the inlet side with the outlet side of the works governor, fitted with a valve and an ordinary drop box, to the outlet of which was affixed a suitable cone and steam injector. This was easily attached by removing the cover, and the steam supply passes through to the outside, and is controlled by a micrometer cock. There is no machinery or moving parts. The usual stand pipe serves for the periodical removal of condensed water from the drip box, and a second on the outlet pipe, at a distance of 15 yards from the injector, collects practically all the remainder of the condensation. When the pressure wave is required, the by-pass valve is opened, and the steam turned on until the desired pressure is shown on the outlet gauge. The back pressure lifts the bell and prevents the back passage of gas through the governor. When the steam is gradually reduced, the bell easily drops, and the usual pressure is resumed. Mr. Scott claims that this contrivance is capable of application to many other purposes in connection with pressure raising than that for which it was specially designed, such, for example, as a safety by-pass in connection with existing boosters or exhausters. If the machinery failed from any cause, or it was desirable to shut down for slight repairs, the steam jet is always available. He also mentions the very general experience now evoking, and other day consumption has acquired such extensive proportions, that the inner lifts of the gas holders are to a large extent useless, and the available storage capacity practically limited to the content of the outer lifts. Only for a few hours out of the 24, from midnight until 5 A.M., and for a short time in the early afternoon, will the inner lifts keep the bell of the governer afloat. The outer lifts give 55 to 60 tenths, the inner 30, and the requirement over at least 16 hours out of the 24 is 30 to 45 tenths. If the stock runs short and the holders uncup, complaints come in from all parts of the district. But with the aid of the steam jet, which can be timed to take up the pressure required as the outer lift grounds, the full outer lift pressure can be maintained on the district, so long as the inner lift is afloat.

House Maintenance of Gas Lighting.

Paper read by WM. O. WEEKES before the Michigan Gas Association.

In presenting this paper before the Association, it has been the writer's aim to offer for your consideration and discussion an outline of the residence lamp maintenance campaign that has been in force in Battle Creek for about a year. It is hoped the experience our company has had with this means of improving our lighting service may contribute something of interest to gas companies contemplating similar means of providing their consumers with a better and more efficient gas lighting service.

We are all aware that gas lamps in the hands of the average consumer do not receive the amount of care and attention necessary to insure their working at their highest efficiency at all times. I believe every gas man present will agree that a satisfactory and not too expensive method of insuring proper attention at stated intervals to the gas lamps in the home of every consumer on their lines would do more to further the use of gas for illumination than anything else which has hitherto been attempted.

Much has been said recently on this subject of free maintenance of residence lamps, and it is becoming an accepted fact that if gas is to continue to occupy its rightful place as the foremost form of illumination, an adequate *house maintenance service* must be given. Therefore, it occurred to the writer that the outline of a plan which has proven successful would probably be more interesting than an abstract discussion of the subject.

Before going further, let me state that it is not the intention to represent the plan we have followed as being above improvement, nor is it offered as being universally applicable, for it is obvious that local conditions must enter largely into an undertaking of this sort. It is offered simply as a method which has really accomplished in a sufficient measure the results we sought to obtain, namely: the rejuvenation of our house lighting business.

When it was first decided by our company that some means of improving our lighting service was imperative if we could hope to not only retain our present business but also to obtain new business, and to educate the people of our community to appreciate the fact that gas lighting properly used is the best and most satisfactory form of home illumination, several plans were considered. It was finally decided that if we were to obtain the desired results, we must establish a system which would be permanent, insuring a regular and systematic canvass of the entire city, and one that would insure enough calls to prevent lamps getting into bad condition through failure to call frequently.

We also decided that whatever method of house maintenance we used must be carried out on a liberal basis, and we realized at the outset that we probably could not hope to derive any profit from it. In fact, we did not expect to, as we were firmly convinced that we could afford to stand a reasonable deficit if, after a thorough trial, it was found that the results warranted it. Therefore, in accordance with this idea, our plan provides that all work done on the consumers' premises shall be absolutely free of charge; that we shall undertake to thoroughly clean and keep in adjustment each and every lamp or burner in the house regardless of make or where purchased. We further decided that any lighting supplies purchased by the consumer should be put on by our workmen in a satisfactory manner, and charged for at the prevailing office prices in order to carry out the policy of making no charge for work done.

The city is divided in 4 districts, each of a size to allow a visit being made to every house in the district at least four times a year, and a man is assigned to each district with the understanding that he is to be held responsible for his own particular territory and he is not allowed to go outside of it. A straight house-to-house canvass plan is followed, the territories being routed in the manner as for meter readers, thus avoiding unnecessary walking and assuring calls being made in a systematic manner. The routine of each man for the day is about as follows:

At 7:30—Check up stock with stockkeeper.
Get any orders that have been left in office.
Report to Commercial Manager on work of preious day, turning in any prospects for appliances.
At 8:15—Start on territory.
At 11:00 A.M.—Phone office for orders and attend to these between 11 and 12 o'clock.
(This hour is used in this way as it is hard to gain access to homes while the housewives are busy with dinner work.)
At 1:00 P.M. and 4 P.M.—Phone the office again for orders, which are taken care of between 4 and 5 o'clock. The balance of the time is spent on the house-to-house canvass.

We do not allow our men to represent themselves as salesmen, but as inspectors, as we believe a great deal of the success of a plan of this nature lies in keeping it away from the sales idea as far as possible, in order that the public may not feel that the main object, after getting into their homes is to sell them something instead of rendering them a valuable service without charge. We, therefore, strive to create the impression that these men have nothing to sell, which, we find, has been of great value in gaining entrance to the homes of our consumers and in obtaining their confidence and co-operation. Even though the men are not allowed to try to sell appliances, we find very frequently consumers will request a gas iron or some other appliance. Under these circumstances, the maintenance men are allowed to take an order for the appliance and turn it into the office, where records are kept of all such orders and are taken into account in compiling individual records of each man. These records are kept and used in the selection of men to fill more important positions.

No attempt is made to force the sale of material, and even though a lamp or burner may be in dire need of repairs, no sale is allowed to be made unless the consumer so requests, but the consumers attention is called to the fact that his gas lighting service is suffering and that by allowing the needed repairs to be made, he can get far better results. We find that there are very few cases in which the consumer is not glad to be able to get the needed material so easily, and they seldom fail to order it.

As before mentioned, the same attention is given to all burners, regardless of where they were purchased, and just as much effort is expended on inferior burners as on those sold by the gas company, although our men are instructed to explain to the consumers the difference between good and poor burners, and to do all possible to convince them it is economy to purchase the best burners, as the best results lie in their use. We endeavor to do this in a friendly spirit, and no "knocking" of inferior burners is indulged in. I might say here that we find the sale of a great many good burners and other lighting appliances to replace inferior ones has resulted

FORM NO. 1.

CALHOUN GAS CO. HOUSE INSPECTION	No. 4 Mantles	No 2 Mantles	Inverted Mantles	Wels. Jr. Mantles	198 Chimneys	Inner Cylinders	V. K. Globes	½ Frosted Globes	I. Opal Globes	618 Lamps	71-306 Lamps	Wels. Jr. Lamps	Clay Nozzles	Pilot Tubes	By-passes	Lamp Tubing	No. 3 Canopies	Inner Cy. Ring		Time	REMARKS.
Mr. Jones, 25 Fremont	1		1			1							1							¾	Cleaned and adj. all lamps.
Mr. Brown, 27 Fremont																				½	Adj. stove and fixed leak.

DATE..... INSPECTOR.....

from the educational work done and recommendations made by these house maintence men on their daily calls.

We have also trained them to keep their eyes open for prospects for other gas burning appliances which they may come across, and the number of sales which have been closed from prospects turned in by these men has been very gratifying.

This, I believe, sufficiently covers the underlying principles of our plan.

The men employed on this work are of the better class. We have tried to select young men of good appearance, and a little above the average intelligence, feeling that the type of men put on this work is of the utmost importance—that the whole plan is of no value if the inspectors have not sufficient knowledge and tact to properly carry it out, handling our customers with good judgment and unfailing courtesy.

Each man, before being allowed to go out alone, is given a month's training, consisting of two weeks in the shop as helper and two weeks in company with one of the regular men on the territory. During the two weeks in the shop they are thoroughly coached in simple pipe work and the operation of all domestic appliances, in order that they may be fitted to take care of minor complaints in regard to stoves, water heaters, etc., while on the job, thereby saving the expense of sending a shop man, as well as giving the customer quick service. They are required to use their best judgment in taking care of other than lighting appliances, and unless the complaint is one which can be remedied in a moment without interfering with their regular work, they are required to report the case to the office for attention.

The regular equipment carried by the men consists of a large handbag, in which is a complete stock of mantles, chimneys (inner cylinders), bray burners, tools consisting of pliers, screw driver and small wrenches, and material for cleaning glassware and all articles necessary to repair and equip any type of lamp sold by the gas company.

These house maintenance men are paid on a straight salary basis, graduated from $1.75 per day for a beginner to $2.50 per day for a competent man. We do not pay a commission to these men on the material sold, as it was thought such a course would not work well in connection with the plan, inasmuch as it would likely lead to the devotion of too much time trying to sell appliances, and the consequent neglect of regular work. No inspector is placed over the men, as our city is not of sufficient size to warrant it, and they are under the direct supervision of the Commercial Manager, reporting personally to him. Supplies are issued to the men each morning, and are charged to them personally by the storekeeper. At the end of the day each man makes out a complete report, as per Form No. 1, illustrated above, on which is shown the street and number of each call made, the material used, if any. The time consumed on each call made is noted, and any remarks are made in the column at the right.

These reports are turned in the following morning, and the material shown on the report is reissued, thus keeping each man's supplies complete and furnishing a reliable method of checking. Each man must also turn in with his report either cash for the material shown used or properly signed orders for same. While discussing our system of making out reports and issuing stock, I might say that we have under consideration the adoption of a somewhat different form of report sheet. This contemplated report sheet is to be contained in a holder such as is used for meter reading slips, one being made out for every account on our ledgers. The consumer's name and address is placed at the top, and the form so designed as to show a complete year's work at each given address on one sheet, thereby enabling closer watch to be kept, and furnishing a convenient means of reference. However, this form has not as yet been developed.

The average number of calls per man per day is from eight to ten, it having been found that if entrance is gained into the house and the work done in the proper manner, the men are not able to make more than that number of calls in a day's time.

In regard to the introduction of this system of house maintenance, a few days before actual work was started, ads. were inserted in the local newspapers, setting forth briefly an outline of the service we were prepared to give, and asking for the co-operation and assistance of our consumers by giving our men entrance into their homes and allowing them to remedy any defects existing in the lighting service. These ads. were run for a short time after the work started, but it was found unnecessary to continue them, owing to the widespread popularity the work attained.

Each house maintenance man is furnished with cards, outlining the service and giving the man's name. These cards are useful where entrance, for some special reason, is not gained, or where no one is found at home. In the latter case, they serve as a notice that our man has called.

With reference to what it costs to maintain such a residence service as we have undertaken, we find that the profit on material sold does not cover the actual cost of keeping this plan in operation, therefore, it cannot be called self-sustaining. The actual cost, however, is much lower than we expected, and, viewed in the light of the results obtained, it may be considered very reasonable. The average cost of maintaining a force of 4 men is about $55 a month over the profit on material sold, or approximately 5½ cents per call made. This charge is partially offset by the fact that the number of complaints received in the shop has been greatly reduced, and also by the fact that phone calls for mantles and lighting supplies, which were formerly attended to by shop men, are taken care of by these men. They call the office three times

a day—at 11 o'clock A.M. and 1 and 4 P.M.—thereby giving prompt service.

Coming now to the question of what good the gas company derives from such a service, it may be best summed up by saying that we have made more actual progress in the past year in promoting the use of gas, as well as the sale, for illumination, than has been made for the past several years. It has shown us, beyond the shadow of doubt, that where gas lamps are properly kept up in the consumer's home, it is not a very hard matter to convince people that gas is a thoroughly satisfactory form of illumination. No better proof of this can be asked than the fact that we are not only retaining our old business, but are gaining lighting business at a greater rate than we have for some time.

We have found that the public appreciates the service we are giving and shows an inclination to co-operate with us to a surprising degree, with the result that not only have complaints been greatly reduced, but our service has been immeasurably improved and we are to-day in a much better position to keep gas lighting on the map, as it were, than ever before. Our consumers' lighting appliances are now in the best shape it is possible to put them, and are being kept so. Where inferior appliances are in use, the consumer has been told of the better results obtainable by the use of good appliances, and is being taught to come to us for his needs, instead of to the store around the corner, where no interest is taken in anything except the profit to be made on the sale.

The value of the educational phase of this work is evidenced by the fact that our sale of high-grade lighting appliances has been greatly increased, and that we find people are now calling us up, requesting us to send the house maintenance man, instead of buying inferior supplies and attempting to put them on themsevles.

In conclusion, let me say that the work we have done this past year along the line of house maintenance has merely given us a glimpse of what can be accomplished. This opens a practically new field for increasing gas sales, as house maintenance is in its infantcy. I gladly offer any information at my command to extend this branch of the service. I shall also be glad to receive any suggestions that may further the interest of gas lighting in the home.

Cooking With Electricity—The Other Side of the Story.

The report of the Committee on Electric Ranges to the Portland Convention of the N. W. Electric Light and Power Association states that:

"On July 15 the committee mailed 353 central stations in the States of Montana, Wyoming, Colorado and New Mexico, and States west thereof, a list of thirty-six questions. By August 10, 161 replies thereto had been received; which show a total of 389,842 residence electric lighting customers. Of these, 220,042 are using gas for fuel and 2,481 electricity, leaving 167,319 homes which use some other form of fuel than gas or electricity. The committee feels that 50% of this last number should become electric cooking customers during the next five years, provided that there is a proper understanding of the importance of this business and efficient co-operation on the part of the central stations and the manufacturers of ranges.

"*Development of Electric Cooking.*—The securing of this amount of business depends upon having:

"1. Economical rates for electric cooking,

"2. Moderately priced and yet efficient cooking and water heating equipment.

"3. An active publicity and selling campaign, handled jointly by the central stations and the manufacturers.

"The general opinion of all who have investigated electric cooking is that a 3-cent rate for this purpose, with 10% cash discount, is necessary to compete with other fuels. On a basis of heat units alone electricity at this price cannot compete with other fuels, but, owing to its much more efficient mode of application and to the lesser shrinkage of electrically cooked foods, it is the opinion of the committee that this rate can secure the business, particularly if range manufacturers use fireless-cooker features in their ranges, and if customers use flat bottomed utensils on the top plates of the range."

This brings up a question which has been known to the gas man, but one which he has studiously avoided. That of utilizing the added efficiency of the fireless cooker principle in range construction. The electric range could not live over night unless this principle were used.

"With 389,842 homes covered by this report, each paying the central station an average of $20 per year for electric lighting service, there should be appreciated the immense field for additional earnings, on the companies part, with a correspondingly small increased investment, from the use of lamp-socket appliances, washing machines, vacuum cleaners, sewing-machine motors, utility motors, air heaters, water heaters, refrigerating machines and electric ranges.

"The central station cannot expect to increase the household expenses of its customers, but it must avail itself of every opportunity to substitute electricity for other agents in their homes, particularly when by so doing it materially improves home conditions.

"*Earnings of $60 per Year per Customer.*—Eventually the central station will secure average earnings of $60 per year from a large portion of its residence customers, and this increase of $40 per customer can be secured by an investment on the central station's part of less than $70 per customer, including plant, transmission and distribution system. Meanwhile the operating expense per customer has very slightly increased, especially so in the case of hydro-electric plants.

"In every instance where commission regulation is in force in the Western States, the committee finds that the commissions have approved low rates for cooking, apparently on the basis of "value of service." As yet, the committee has been unable to find a single instance of serious objections on the part of customers using electric service for other purposes to the low cooking or heating rates.

"*Competition with Gas.*—The following statement was submitted to the committee by a combination gas and electric official as representing the attitude of combination gas and electric men:

"When the average efficiency of use of gas and electricity is taken into consideration the following table shows the rates for each that are comparable:

Gas per 1,000 Cu. Ft.	Electricity per Kilowatt-hour, Cents.	Gas per 1,000 Cu Ft.	Electricity per Kilowatt-hour Cents.
$0.75	1.25	$1.75	2.92
0.90	1.50	2.00	3.33
1.00	1.67	2.25	3.75
1.25	2.08	2.50	4.17
1.50	2.50		

"With a total of some 160,000 homes to be supplied with electric ranges at, say an average return to manufacturer of $35 apiece, the same number of water heaters at an average of $9 apiece, and a sale on the part of the manufacturer for each range of $12 in transformers, $8 in meters and $30 in supplies, the committee feels warranted in urging upon the manufacturer an exceedingly active co-operation in the development of this business."

When the gas men will show any inclination to purchase ranges comparable with the kind the electric range manufacturer will receive $35 for, then we will see new life and vigor among the gas range manufacturers. Unless the gas men take kindly to new apparatus which utilizes the heat production efficiency of bodies having radio-activity, and then conserving this with modern application of non-radiating enclosing structure, then we will see the gas cooking business in the same unhappy state as is gas lighting.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

1,145,672. Closure Means for Gas Retorts. H. A. Carpenter, R. L. Hibbard and C. Warren, Sewickley, Pa., assignors to Riter-Conley Mfg. Co., Pittsburgh, Pa.

1,146,943. Gas Burner. P. T. A. Lasschuit, Schoten, Netherlands, assignor of one-fourth to P. F. Thomsen, The Hague, one-fourth to J. A. Luii, Haarlem, and one-fourth to W. J. Van Dam, The Hague, Netherlands.

1,147,103. Gas Bench. W. C. Laird, New York City, and G. R. Shields, Detroit, Mich., assignors to The Improved Equipment Co., New York City.

1,147,315. Gas Meter. A. H. Eddy, Edgewood Station, R. I.

1,147,521. Gas Heater. H. E. Loebe, Jersey City, N. J.

1,147,608. Gas Generating System. C. E. Clark, New York City.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

A FRANCHISE has been granted to the Kentucky Public Service Company to lay a pipe line on the Lawrenceburg Pike, so that the Louisville mains of the Kentucky Gas and Electric Company may be tapped and natural gas shipped to supply Frankfort, Ky.

"POP" HAYWARD'S son, Harold, became a benedict on Sept. 16, the bride, Miss Pauline Gentzlinger, will probably make her first appearance before the fraternity at the Gas Congress.

MR. HENRY T. BUFFINGTON, New Business Manager of the Marion Gas Company, of Wareham, Mass., also took unto himself a helpmate in the person of Miss Ellen S. Hurley, a native of his adopted city.

A PETITION signed by the Franklin (Mass.) Gas Company was presented the board of selectmen at a regular meeting Sept. 10, asking for a hearing for the purpose of securing a franchise from the town to install a gas system. The board, after discussing the matter, voted to lay the petition on the table for one week, in order that they may have time for investigation.

WITH further reference to the use of gas and electricity for industrial purposes by the Willys-Overland Company of Toledo, Ohio, the installation was nearer 15,000 k.w. than 15 k.w., and does not displace gas. The artificial gas supply to that company continues to increase, being about 1,000,000 cubic feet per day at this time. Mr. H. O. Loebell, who has charge of the Industrial Heating Division of the H. L. Doherty organization, has not deserted the gas field, and devotes more of his time to industrial gas heating than to anything else. It is further stated that the electric heating development to date has displaced crude oil fuel and remarkably little gas. These facts should act as a further incentive to gas companies to go after this field energetically.

THE Newburyport (Mass.) Gas and Electric Company have asked permission to erect poles on Temple street and Merrill street. On motion of Aldarmen Cusack the clerk was ordered to advertise a hearing on the matter which will be held shortly.

AT the annual meeting of the Worcester (Mass.) Gas Company, held September 15th, Messrs. A. G. Bullock, F. H. Dewey, Dr. Samuel B. Woodward, T. B. Eaton, George Crompton and Dana D. Barnum were elected directors. The directors organized with Dana D. Barnum as president; F. H. Dewey, vice-president and general counsel; DeWitt Clinton, treasurer and clerk; In the directors' report it was shown that during the past year the company sold 18,482 tons of coke, which gives some idea of the use of coke for fuel in Worcester. The company practically doubled its output of coke, the increase over last year being 43%. During the year the company sold 895,000,000 cubic feet of gas and used 48,000 tons of coal and 1,250,000 gallons of oil in the manufacture of gas. The company laid 6.3 miles of pipe, making a total of 207.4 miles in the city. The company sold during the year 786 gas ranges, 354 gas heaters, 75 industrial gas furnaces.

EMPLOYEES of the People's Gas Light Company, Manchester, N. H., to the number of 60, took possession of The Elms, Goff's Falls, for the annual field day of the company, on the 15th. A long list of sports, including a base ball game and tug of war, and a fine dinner served in the pavillion, formed a combination that furnished entertainment in plenty for the gas men. The city was left behind at 10 o'clock, when a special car was boarded at City Hall. First of all it was a good day to get away from the city, and who wouldn't go on this event when past parties by the company proved so pleasant. The base ball diamond was invaded upon the arrival of the party, the shop defeating the office in a well-played game by an 8 to 5 score—a good contest, despite the warm weather. C. T. Aaron and Nelson Whitney was the prize battery that won the honors for the victorious nine, while the main squad of the defeated players was made up of J. C. Aaron, Albert Keller and W. G. Fontaine. The diamond contest brought out much fun and was entered into with much vim. Following the ball game, dinner was served at 1 o'clock, which was some menu. Ask any of them. Sports were continued after the dinner. W. G. Africa was chairman of the committee of arrangements, and was ably assisted by William J. Kennely, Daniel A. O'Brien, W. G. Fontaine and J. A. Aaron, the latter secretary of the association for the employees. The party remained on the grounds until late in the afternoon.

SUPERINTENDENT A. J. SPORLES has received the required number of names to the petition for a gas plant at Greenwood, S. C., and the enterprise is assured. Some time age the Water and Lights Commissioners decided, after thorough investigation, that if as many as 300 patrons of a gas plant were assured, the plant would be built. This number has been secured and bids on the plant are being solicited. It is intended to have the plant in operation within a year.

HARRY W. EASTERLY, formerly head of the commercial department of the Eastern Wisconsin Railway and Light Company, and who has been located at Green Bay (Wis.) for some time, has been promoted to the position of manager of the new business department of the Sheboygan (Wis.) Gas Light Company. Mr. Easterly went to Green Bay about a year and a half ago to become manager of the business department of the Wisconsin Public Service Company of that place. He will go to Sheboygan within a week to assume his new duties there. The Sheboygan company is owned by the same syndicate that controls the Green Bay concern. C. M. Axford will succeed Mr. Easterly at Green Bay.

THE American Gas and Incineration Company made an application for a franchise to install a gas plant in the city of Hood River, Ore., at the meeting of the city Council held last week. The matter was referred to the health committee of the council for consideration, and Mr. W. C. Wyman, western representative, will meet with the committee to outline the company's proposition for the proposed plant. Mr. Wyman states that the investment in Hood River to supply the city with gas would cost approximately $40,000. Several sites have been investigated, and a number of the property owners concerned have expressed their willingness to charge only a nominal price for their property. It is said by Mr. Wyman that gas could be furnished citizens of Hood River at a cost not to exceed $1.50 per 1,000 cubic feet. The company proposes to start work on the plant as soon as a suitable location can be secured, if the franchise is granted.

THE Charlotte (Mich.) Gas Company has secured a piece of property in the west part of the city for the purpose of erecting a large storage gas tank, and work on the same will be commenced at once. This company has about 400 subscribers for gas at this time, which has been furnished for the last three years by a pipe system.

A NEW trial was refused to the city of Pittsburgh, Pa., in an opinion handed down by Judge Ambrose B. Reid in the case in which the city refused to pay for gas supplied to the municipal hospital, claiming that under the Westinghouse ordinance gas was to be furnished free to all city property departments. The Philadelphia company has been furnishing gas to the hospital since 1884, and always was paid for it until February 27, 1911, when payment was refused by the city controller. A suit was then entered by the gas company to recover $3,715.81, which it claimed was due for gas furnished from February 27, 1911, to July 27, 1912. The case was heard before the jury and a verdict returned in favor of the Philadelphia company. A motion was made for a new trial, and Judge Reid was asked to set aside the verdict. It was admitted that a contract was entered into by the city when the plaintiff company to furnish gas at the municipal hospital, and that bills were paid for some years. It was alleged that the contract was void because competitive bids were not asked for as is required by law, and that the contract was not properly signed by the city controller. Under the evidence in the case the Philadelphia company was the only company which was in a position to furnish gas to the city. In commenting upon this, the court said: "It is contended by the defendant that notwithstanding these facts, the city authorities could not lawfully enter into the contract in suit without advertising. In other words, the city must be required to do a vain thing, since for all practical purposes the situation was much the same as though there were no other supply available from any other company within the district. In effect, the plaintiff was the only dealer who would or could supply the commodity. The court did not rule that advertising was not re-

quired, but left it to the jury to determine whether, under all the circumstances there should be competitive bids from other dealers. The form of admission was not hardly expressed, but the question of proximity and reasonable expectation of such competition was certainly one of fact, to be at least, in the first place, determined by the jury. Upon all the questions submitted for consideration to the jury, their verdict indicated that they were all resolved in favor of the plaintiff." The court also held that the question of whether or not the municipal hospital could be construed as coming within city property departments which were entitled to free gas under the Westinghouse ordinance passed in 1884, was also a question of fact to be determined by the jury.

PERCEY E. TENNANT has sold the Pew block, on the south side of Fall street, Seneca Falls, N. Y., to the Empire Gas and Electric Company. The company will remodel the west half of the building for offices and display rooms. The property brought $13,500. Mr. Tennant purchased it a year ago for $9,500. The gas company intends to build an addition of 26 feet on the rear of the building, providing a repair department in the basement.

FOLLOWING the policy of extending its mains and replacing the old time ones of insufficient size with larger ones, suited to the demands upon them, the Plymouth (Mass.) Gas Company has been busy in tearing up the macadam and tarvia pavement on Water street, north of Howland street, where the main plant is located, and placing a large wrought iron main, with 20-foot sections of pipe screwed together in couplings, as has been done in other parts of the town.

THE State Railroad Commission of California will take up the fiixing of the Los Angeles gas rates early in December. Information to this effect has just been received by Fulton Lane, President of the Board of Public Utilities, from an official of the State Commission, who is here to make an appraisal of the systems of the Los Angeles Gas and Electric Corporation and the Southern California Gas Company. Both these companies have refused to sell gas at 64½ cents, the city's rate, which is being obeyed by the Economic Gas Company, by the serving of pure natural gas.

THE special committee of the city council of Waycross, Ga., composed of Aldermen Sharpe, Lott and Latimer, have held a meeting for the purpose of discussing the proposition offered the city by Appleby, Wagner & Company, of Saginaw, Mich., relative to a gas franchise. After going into the proposition, the committee decided that there were several details in same that could not be agreed upon without further knowledge, and the city clerk was, therefore, instructed to write the company making application to send a representative to Waycross in order that all details may be worked out in a satisfactory manner. It is understood that the members of the council generally feel that inasmuch as Waycross has waited these many years for gas, she can now wait rather than grant a franchise in a hurry to people who can not carry out their part of the contract. It is believed, however, that the Appleby, Wagner Company is in every way responsible, and would lose no time in building a plant in the event a franchise is granted it.

PERMISSION was sought, and practically secured, at a special meeting of the Board of Freeholders, by the Standard Gas Company of Atlantic Highlands, N. J., in conjunction with the Freehold Gas Light Company, to open the country road from Freneau to Freehold for the purpose of laying a 4" gas main. R. H. Garrison, representing the former, and H. V. M. Dennis the latter company, appeared before the Freeholders and presented their requests, Mr. Garrison explaining that his company had been granted a franchise by a former board some time since. Director Corlies explained that there is a general form of application and agreement which the applicants should fill out, and Charles M. Wyckoff was appointed a committee of one to act for the Board.

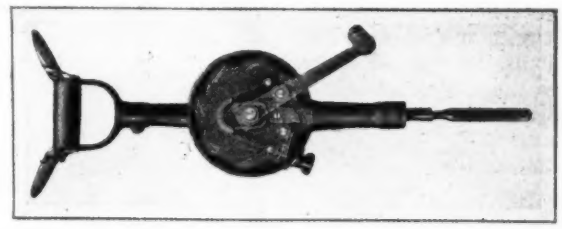
ANOTHER echo from Plattsburg, N. Y., the camp of "preparedness." Mr. R. ff Pierce, of Gloucester, won much glory for his valiant efforts, but he dispelled our ideas of soldierly adornment, as part of his bristling and awe-inspired radiations have been lost.

MR. S. P. VECKER, Manager of the Key West Gas Co., has just returned from a 3 months' trip to Panama, where his company obtained franchises for constructing gas plants both at Colon and at Panama City. Mr. Vecker has been making the necessary investigations previous to starting construction work, and reports that Panama will prove a good gas field.

New Methods and Appliances.

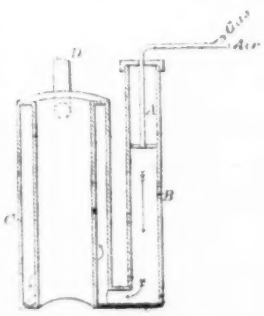
AN IMPROVED BRICK AND CONCRETE DRILL.—An improved form of drill, for brick and concrete work, has been placed on the market by the Diamond Expansion Bolt Company, New York City. It provides for an adjustment screw for regulating the power of the blow exerted upon the drill, and an extension spring operated over the yoke which straddles the main shaft at the rear of the plunger.

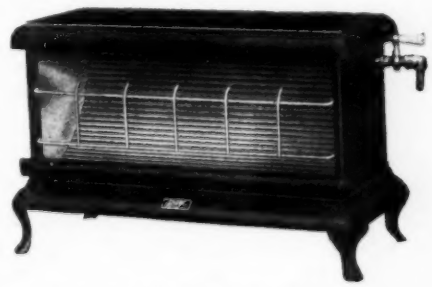
The spring is adjustable by a wing nut that varies the amount of tension in the spring. This adjustment, it is claimed, enables light blows to be struck for drilling small holes in delicate surfaces, while by increasing the tension through the wing nut, the drill can be made to deliver heavier blows for the larger sizes of holes in hard stone. The plunger slides between guide rollers and is rigidly attached to the yoke that straddles the main cam wheel shaft.



To increase the efficiency of this drill where a number of holes are to be drilled in ceilings, a stand has been developed, which is made in telescopic sections. The sections are readily adjusted to any heights of ceilings from 7 to 20 feet, and the drill is forced into the hole by a spring. Where work has to be done on a floor, a floor stand, mounted on wheels, has been developed, which enables the operator to withdraw the drill from a hole easily and slide the drill and seat to the next one.

INTERNAL GAS HEATER FOR LIQUIDS.—The Gas Light and Coke Company, of London, England, are offering an apparatus for heating liquids from within, the great advantage of which is that containers of any material can be used. In some industries wooden vats are necessary for holding liquids to be heated, and hitherto steam has been used for this purpose. The new internal heater, designed by Mr. B. Brooks, of the Gas Light and Coke Company, however, now enables gas to be used successfully. Practically the whole of the heat of combustion is absorbed by the surrounding liquid. The apparatus comprises a vertical steel tube, *B*, in which burns a mixture of low pressure gas and high pressure air (about 2 lbs. per square inch). There is no special burner nozzle—only a plain tube, *A*, passing vertically through a cover-plate at the top, all the air being supplied by the blast; another plate in the tube near the burner mouth prevents the flame flashing back when the apparatus is started cold. At the bottom of the vertical tube the products of combustion pass through a lateral passage and enter tangentially into a cast iron annular chamber, *C*, through which they take an upward helical path, and pass away via a flue pipe, *D*. This method of heating has been found far more satisfactory in the cases mentioned than is the use of steam. External ribs have been tried on the annular chambers to increase the heating surface, but no great improvement was noticed, and the heaters are now made without them.





SUNBEAM HEATERS.—To the cold room the Sunbeam Heater brings warmth and cheer. The warm rays are thrown out from the corrugated copper reflector like real sunbeams. Light in weight it is quickly moved to the place of need. Small in price, easy to install but effective in results. Clark-Jewel Sunbeam Heaters are made in three sizes.

Financial Notes.

IN the year ended June 30, 1915, NEWBURYPORT (Mass.) GAS AND ELECTRIC COMPANY, after paying 8% dividend and all charges, earned a surplus of between $7,000 and $8,000. The actual figures are as follows:

Net income gas department	$9,672
Net income electric department	23,532
Rents, jobbing, miscellaneous income	700
Total	$33,904

Out of this has been deducted dividends at the rate of 8%, amounting to $22,800, interest on notes $3,798, and bad debts $258, the balance being carried to surplus account.

EXPERTS, acting under the direction of the State Public Utilities Commission, have begun the examination of the books of the PEOPLE'S GAS LIGHT AND COKE COMPANY to find out exactly how much it costs the company to furnish gas to Chicago homes. Upon the ultimate findings of these experts will depend the rates to be fixed by the commission. This program was adopted recently, when the commission took up Mayor Thompson's appeal to reduce the gas rate from 80 cents to 60 cents per 1,000 cubic feet. The accountants, in their examination of the company's books, will endeavor to find out just how much money has been invested in the company's properties, and how much the present earnings are. It is expected that the experts will be ready to make their report November 9, when the commission again will give its attention to the gas rate question.

INFORMATION has been received by officers of the OHIO CITIES GAS COMPANY that governors of the Cincinnati Stock Exchange had ordered the common and preferred stocks of the Columbus Gas and Fuel Company stricken from the stock list. The action was taken as a result of a request made by G. C. Scott. Secretary-Treasurer of the Columbus Gas and Fuel Company, on the ground that practically the entire issue of the company's stock had been absorbed by the Ohio Cities Gas Company. No similar action will be taken in Columbus, because the stocks have not been called here for some time. It was said at the local offices, that all of the common stock but about 25 or 30 shares, out of a total of 30,000, had been exchanged for securities of the Ohio Cities Company, and that less than 1% of the preferred stock is outstanding. The Columbus Gas and Fuel Company was organized in 1906, resulting from a merger of the Central Ohio Natural Gas and Fuel Company, and the Columbus Gas Company. The common stock, $100 par, was issued to the extent of $3,000,000, and preferred stock to the amount of $6,000,000 was subscribed. Prior to its absorption by the Ohio Cities Gas Company, the Columbus Gas and Fuel Company, through its subsidiary, the Columbus Oil and Fuel Company, acquired a large acreage of gas and oil rights in West Virginia. Later the Columbus Producing Company was launched under West Virginia laws, and all the property belonging formerly to the Columbus Oil and Fuel Company in West Virginia, was sold to the Producing Company in exchange for its entire capital stock. At the same time the Columbia Gas and Fuel Company purchased the gas plant of the Ohio Fuel Supply Company, serving approximately 11,000 consumers in Columbus and suburbs, and the Columbus Oil and Fuel Company took over from the Ohio Fuel Supply Company the entire capital stock of the Federal Gas and Fuel Company, which latter company operates a gas plant serving 11,000 consumers in Columbus. The Columbus Oil and Fuel Company also purchased the entire stock of the Springfield Gas Company, serving approximately 12,000 customers. In order that these valuable properties could be held, owned and operated under one management, the Ohio Cities Gas Company was incorporated in 1914, with a capital stock of $20,000,000. In taking over the Columbus Gas and Fuel Company, an exchange of stock, share for share, was made, with a total issue of $7,250,000 preferred and $5,550,-550 common outstanding.

CONFIDENCE in the rapid revival of business was the prevailing sentiment at the meeting of the officers and department executives of H. M. Byllesby & Company, and resident managers of the public utility properties managed by the firm, at a meeting at the Blackstone Hotel, Chicago, September 10th. Addressing the managers, Mr. Byllesby stated that the financial situation, insofar as it affected the enterprises of the organization, was materially better than it had been at any time during the past three years. He said it was now comparatively easy to find capital for extensions and improvements, provided the earning capacity of the investment was demonstrated. O. E. Osthoff, vice-president and chief engineer, described the successful results which have followed the effort of the Northern States Power Company to interest the electric and gas customers of the organization in the purchase of that company's 7% preferred stock. The new 6% twenty-year gold note financing of Standard Gas and Electric Company was explained in detail by J. J. O'Brien, vice-president and treasurer, and the statement made that its success was already assured. Mr. O'Brien suggested that resident managers make a beginning toward creating a demand for the securities of Standard Gas and Electric Company in the cities served by its electric and gas companies. Eventually, he believed, a large portion of Standard's securities will be so held, if proper educational effort is put forth. Plans for enlarging the activities of the operating utility companies were discussed with vigor and enthusiasm.

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